APPENDIX

A

How Changes in Economic Assumptions Can Affect Budget Projections

The federal budget is sensitive to economic conditions. Revenues depend on taxable income—including wages and salaries, nonwage income, and corporate profits—which generally moves in step with overall economic activity. Spending for many mandatory programs is pegged to inflation either directly (as in Social Security) or indirectly (as in Medicaid). In addition, the Treasury regularly refinances portions of the government's debt at market rates, so the amount of federal spending for interest on that debt is directly tied to such rates.

To illustrate how assumptions about the economy can affect federal budget projections, the Congressional Budget Office (CBO) uses key economic variables to construct "rules of thumb." Those rules provide rough orders of magnitude for gauging how changes in individual economic variables, taken in isolation, will affect the budget's totals. They are not intended to substitute for a full analysis of an alternative economic forecast.

Four variables that figure in this illustration are real (inflation-adjusted) growth, interest rates, inflation, and wages and salaries as a percentage of the economy. For real growth, CBO's rule of thumb shows the effects of a rate that is 0.1 percentage point higher each year, beginning in January 2005, than the assumed rate of economic growth that underlies the agency's baseline budget projections (outlined in Chapter 1). The rules of thumb for interest rates and inflation assume an increase of 1 percentage point over the rates in the baseline, also starting in January 2005.

The rule of thumb for wages and salaries assumes that, beginning in January 2005, wages and salaries are 47 percent of gross domestic product (GDP) and that they continue to be 1 percentage point higher than the share assumed in the baseline for each year of the projection period. Corporate profits are therefore assumed to be 1 percentage point lower each year. This scenario assumes no change in projected levels of nominal or real GDP (which vary in two of the other rules of thumb).

Each rule of thumb is roughly symmetrical. Thus, the effects of lower growth, lower interest rates, lower inflation, or lower wages and salaries as a share of GDP would have about the same magnitude as the effects shown in this appendix, but with the opposite sign. The calculations that appear in this appendix are merely illustrative of the impact that such changes can have. CBO chooses the variations of 0.1 percentage point or 1 percentage point, respectively, for the sake of simplicity alone. Extrapolating from small, incremental rule-of-thumb calculations to much larger changes would be inadvisable because the magnitude of the effect of a larger change is not necessarily a multiple of a smaller change.

Higher Real Growth

Stronger economic growth improves the federal budget's bottom line, and weaker economic growth worsens it. The first rule of thumb outlines the budgetary impact of economic growth that is slightly stronger than CBO's baseline assumes. Specifically, the rule illustrates the effects of growth rates for real GDP that are higher by 0.1 percentage point every year from January 2005 through the end of fiscal year 2015. Those effects differ from the effects of a cyclical change, such as a recession, which are much shorter-term in nature and usually larger in magnitude.

The baseline reflects an assumption that real GDP growth is 3.8 percent in calendar year 2005, 3.7 percent in 2006, and that it averages 2.9 percent from 2007 to

Table A-1.

Estimated Effects of Selected Economic Changes on CBO's Baseline Budget Projections

(Billions of dollars)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total, 2006-2010	Total, 2006-2015
Growth Rate of Real GDP Is 0.1 Percentage Point Higher per Year													
Change in Revenues	1	3	6	9	13	17	22	27	33	38	44	48	212
Change in Outlays													
Net interest (Debt service)	*	*	*	-1	-2	-3	-4	-6	-8	-11	-14	-6	-49
Mandatory spending	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	*	*	-1	-1	-2	-3	-4	-6	-8	-10	-14	-6	-48
Change in Deficit or Surplus[a]	1	3	7	10	15	20	26	33	40	49	58	55	261
Interest Rates Are 1 Percentage Point Higher per Year													
Change in Revenues	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Outlays													
Higher rates	10	23	32	37	42	46	48	49	49	50	49	180	425
Debt service	*	1	3	5	8	11	15	19	23	27	32	29	145
Total	10	25	35	42	50	57	63	68	72	77	82	209	570
Change in Deficit or Surplus[a]	-10	-25	-35	-42	-50	-57	-63	-68	-72	-77	-82	-209	-570
Inflation Is 1 Percentage Point Higher per Year													
Change in Revenues	12	35	62	94	131	170	210	262	317	373	433	492	2,087
Change in Outlays													
Higher rates[b]	13	27	35	40	45	50	52	54	54	55	56	198	469
Debt service	*	*	1	1	2	1	1	*	-3	-6	-11	6	-14
Discretionary spending	0	5	13	22	32	43	55	66	79	92	106	116	515
Mandatory spending	1	11	23	36	52	69	89	110	136	164	196	191	886
Total	14	44	72	100	131	164	196	230	266	305	347	511	1,856
Change in Deficit or Surplus[a]	-3	-9	-9	-6	*	6	13	32	50	68	87	-19	231
Wages and Salaries' Share of GDP Is 1 Percentage Point Higher per Year													
Change in Revenues	11	12	14	16	17	18	20	21	23	24	25	76	190
Change in Outlays (Debt service)	*	-1	-1	-2	-3	-4	-6	-7	-8	-10	-12	-12	-55
Change in Deficit or Surplus[a]	11	12	15	18	21	22	25	28	31	34	37	88	244

Source: Congressional Budget Office.

Note: * = between -$500 million and $500 million.

a. Positive amounts indicate a decrease in the deficit or an increase in the surplus.

b. The change in outlays attributable to higher rates in this scenario is different than the estimate in the rule of thumb for interest rates because the principal on Treasury Inflation-Protected Securities grows with inflation.

2015 (see Chapter 2). Adding 0.1 percentage point to that rate each year means that the level of GDP would rise about 1 percent above the level assumed in CBO's baseline by 2015.

A higher rate of growth for GDP would have a number of budgetary implications. For example, it would suggest higher growth in taxable income, leading to increases in revenues that would mount from $1 billion in 2005 to $44 billion in 2015 (see Table A-1). Revenue gains would total 0.7 percent of the projected revenues over the 2006-2015 period.

Higher revenues would mean that the federal government borrowed less and incurred lower interest costs. The payments to service the debt would be minimally lower during the first few years of the projection period; but in later years those annual savings would gradually increase by amounts that reach $14 billion in 2015. The impact of debt-service savings would be blunted slightly by outlay increases, mostly for Medicare. All told, growth in real GDP that was 0.1 percentage point a year higher than the rate assumed in CBO's baseline would reduce deficits by amounts that climb to $58 billion a year by 2015.

Higher Interest Rates

The second rule of thumb illustrates the sensitivity of the budget to changes in interest rates, which affect the flow of interest to and from the federal government. When the budget is in deficit, the Treasury must borrow additional funds from the public to cover any shortfall. When the budget is in surplus, the Treasury uses some of its income to reduce debt held by the public. In either case, the Treasury refinances a portion of its debt at market interest rates.

Under the assumption that, each year, interest rates are 1 percentage point higher than in the baseline for all maturities and that all other economic variables are unchanged, interest costs would be approximately $10 billion higher in 2005 (see Table A-1). That initial jump in interest costs would be fueled largely by the extra costs of refinancing the government's Treasury bills (securities with maturities of six months or less), which make up about 25 percent of its marketable debt. Roughly $1 trillion in Treasury bills is currently outstanding; all of those bills mature within the next six months. The bulk of marketable debt, however, consists of medium-term notes and long-term bonds, which were issued with initial maturities of two to 30 years. As those securities mature, they will be replaced with new securities (the Treasury currently issues two-, three-, five-, and 10-year notes). Correspondingly, the budgetary effects mount; by 2010, the impact of interest rates that are 1 percentage point higher than is assumed in the baseline would be $46 billion, an impact that levels off for the remainder of the projection period.

Under this scenario, the Treasury would have to raise additional cash (above the levels assumed in the baseline) to finance the larger outlays related to higher interest rates. By 2015, such debt-service costs would climb to $32 billion. All told, if interest rates were a full percentage point higher than the rates assumed in CBO's baseline, interest payments (including additional debt-service costs) would surpass baseline levels by increasing amounts, reaching $82 billion by 2015.

Higher Inflation

The third rule of thumb shows the budgetary impact of inflation that is 1 percentage point higher than the level assumed in the baseline. The effects of inflation on federal revenues and outlays tend to offset each other, although the impact on revenues is somewhat larger.

On the one hand, higher inflation and its effects on wages and other income translate directly into higher amounts of income taxes and payroll taxes withheld from people's paychecks. The impact of the higher personal incomes on revenues is reduced, with a lag, by indexation of tax brackets for inflation. In addition, higher corporate profits from faster growth in prices quickly boost receipts from firms' quarterly estimated tax payments. Those results reduce projected deficits or increase projected surpluses.

On the other hand, higher inflation pushes up spending for many benefit programs and drives growth in projections of discretionary spending. Many mandatory programs automatically adjust benefit levels each year to reflect price increases. Social Security, federal employees' retirement programs, Supplemental Security Income, veterans' disability compensation, food stamps, and child nutrition programs, among others, are adjusted (with a lag) for changes in the consumer price index or one of its components. Many Medicare reimbursement rates are also adjusted annually for inflation. Other programs, such as Medicaid, are not formally indexed but nonethe-

less grow with inflation. To the extent that the benefit payments that participants in retirement and disability programs initially receive are related to wages, changes in nominal wages will be reflected in future outlays for those programs. Finally, future spending for discretionary programs is projected on the basis of assumed rates of wage and price growth.

Inflation also has an impact on net interest because it is one component of nominal long-term interest rates (the other being a real rate of return). For example, if real rates of return remain constant, but inflation rises, interest rates will climb, and new federal borrowing will incur higher interest costs. In deriving this rule of thumb, CBO assumes that nominal interest rates rise in step with the increase in inflation, thus increasing the cost of financing the government's debt.

An annual increase of 1 percentage point in projected inflation in every year of the baseline period would boost revenues by about 7 percent from 2006 through 2015—and increase outlays by about 6 percent over that same period (see Table A-1). In the near term, the net effect would be higher deficits—as increases in outlays exceed the higher revenues. This is in large part because CBO assumes that interest rates rise when inflation increases, thus driving up interest payments. Mandatory spending responds to higher inflation in the short run as well. From 2005 through 2008, those increases in outlays exceed the boost in revenues projected under this scenario.

By 2009, however, the revenue acceleration associated with higher inflation overcomes the higher outlay levels. Revenues exceed outlays by $87 billion by the end of the projection period. Including debt-service costs, the net effect of this scenario is a reduction of $231 billion in the cumulative deficit over the 2006-2015 period.

Wages and Salaries as a Higher Percentage of GDP

Because different types of income are taxed at different rates, the variation in income shares over time has contributed to upward and downward movements in tax receipts relative to GDP. Considerable uncertainty exists in projections of the income shares.

Two of the most important types of income for projecting federal revenues are wages and salaries and corporate profits. Wages and salaries are the most highly taxed income in CBO's economic forecast. They are subject to taxation under the individual income tax as well as through payroll taxes for Social Security (up to a maximum amount) and Medicare. CBO estimates that an additional dollar of corporate profits produces less revenue than an additional dollar of wages and salaries. As a result, higher projections for wages and salaries, and correspondingly lower projections for profits, result in higher projected budget receipts.

CBO estimates that a shift of 1 percentage point of GDP out of profits and into wages and salaries would lead to gains in revenues of $11 billion in 2005, rising to $25 billion in 2015 (see Table A-1). Higher revenues would lead to an annual reduction in borrowing that would gradually reach $12 billion by 2015. Overall, under this scenario, the 2015 deficit would be $37 billion lower than that projected in the baseline, and the cumulative deficits over the 2006-2015 period would be reduced by 0.8 percent of projected revenues over the period.